TiO_2NPs. With fluorescence quenching studies we found the binding constant of TiO_2NPs–DOX with ct DNA. Collectively, results of the present study demonstrated that this combination can alter conformation of B-DNA. Growth inhibitory and apoptotic effects of DOX and TiO_2NPs complexes toward the breast cancer cells (MCF7) after 48 hours were measured. These results displayed that DOX + TiO_2NPs have more growth inhibitory and inducing apoptosis against MCF7, than DOX or TiO_2NPs alone. The result obtained from this study probably provide useful information to design better drug for breast cancer with less side effects and therefore developing more efficient anti cancer drugs in the future.

Keywords: Breast cancer, Doxorubicin, DNA, TiO_2 nanoparticles, MCF7

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E Poster – [A-10-468-1]

Effect of temperature on the activity of α-amylase immobilized onto magnetic nanoparticles

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Introduction: Some important biomedical applications based on conjugates of nanoparticles and biomolecules have been demonstrated. The magnetic nanoparticles combined with biomolecules are easily controlled and recovered for reuse by the application of an external magnetic field. The conjugation of protein with nanoparticles can be applied for enzyme immobilization for hydrolysis of polysaccharides.

Methods: In the present study, α-amylase was bound to Fe_3O_4 magnetic nanoparticles in the presence of carbodiimide as a coupling agent using shaking method at 4 °C for 24 h. The binding of α-amylase on the particles was confirmed by Fourier transform infrared spectra. The effect of temperature on the activity of immobilized enzyme was compared with the free enzyme in the range of 20–60 °C at pH 5 for 20 min of incubation. The optimum pH for free and immobilized amylase was practically found to be 5.

Results: The free α-amylase exhibited a temperature optimum of 30 °C and this shifted to 35 °C for immobilized α-amylase. Immobilized α-amylase showed residual activity about 2.7 fold access compared with free enzyme in 60 °C.

Conclusion: The results indicated that immobilized α-amylase was more resistant to heat and had a better optimum temperature than the free form. We hypothesize that the bound enzyme could possibly undergo a conformational change and a spatial rearrangement that could slow down the folding process and denaturation of the enzyme.

Keywords: α-amylase, Magnetic nanoparticles, Immobilization, Carbodiimide, Optimum temperature

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Engineering and characterization of collagen-based bio-nanocomposite as scaffolds for tissue engineering purposes

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Introduction: Chemically and physically modified polymeric nano composites such as collagen-poly (vinyl-alcohol)-nano hydroxyapatite (HA), in this study can use as scaffolds for tissue engineering purposes. Starting from various compositions, different kinds of composites were obtained according to D-optimal design for three accompanying component mixtures. The experimental design method (DOE) was used for understanding the thermal behavior and structural characteristics in the porous membranes. The materials were analyzed by FTIR, SEM and TGA.

Experimental: In situ preparation of a CH–PVA/HA nano-porous membrane was done by dissolving P_2O_5 and $Ca(NO_3)2.4H_2O$ in ethanol then, mixing at 1400 rpm in room temperature (solution 1). Polymer blends were prepared by mixing CH and PVA and adding them into a small quantity of water (solution 2). Solution 2 was dissolved in solution 1 and put in an oven at 70 °C for 12 h to obtain a polymer-nano-porous membrane.

Results and discussion: The SEM images show the polymer matrix CH–PVA, and CH–PVA/HA nano-porous membrane. The HA particles have sizes in the range of almost 38 to 42 nm. Infrared spectroscopy was used to characterize the CH–PVA hybrid and CH–PVA/HA nano composite materials. According to TG thermogram, the reaction between HA and COL-PVA was influenced on the tertiary weight loss stage of CH–PVA blend materials. The porosity of these nanocomposites was measured by the Arthur method. The method of DOE helped to identify the effect of CH, PVA and HA on thermal and structural properties evaluated on the basis of this method. According to the DOE method, based on thermal gravimetric analyses and structural measurements, tertiary weight loss temperature and porosity increased with the content of HA in the blends. The effect of PVA is the opposite. This bioartificial material meets our demands in a range of medical applications.

Keywords: Collagen, Poly (vinyl-alcohol), Nano composite, Scaffold, Tissue engineering

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Nutritional Biochemistry

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Effect of vitamin A supplementation on inflammatory factors in patients with ulcerative colitis

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Background: Ulcerative colitis (UC) is an inflammatory disease of the rectal and colonic mucosa and seems to result from a complex series of interactions between susceptibility genes, the environment and the immune system. There is a paucity of data on the positive effect of vitamin A on intestinal mocusal immunity. We aimed to evaluate the effect of vitamin A supplementation on pro inflammatory interleukin 17 and CRP in ulcerative colitis.

Methods: Immunological assessment was done in 43 patients with ulcerative colitis participating in a before and after interven-